

MISCELLANEOUS.

To Richard Taylor, Esq.

Calcutta, December 14, 1843.

MY DEAR SIR,

Up to this date the following additions have been made to my catalogue of Calcutta birds, which, if not too late, you may publish along with the rest*: *Phenicophaus tristis*, v. *Melias tristis* of Lesson; *Ph. longicaudatus* of my monograph of Eastern Cuckoos, wherein the name *tristis* is erroneously ascribed to *Ph. sumatranus* (Raffles), vel *Diardi* of Lesson, a species common on the hill-ranges of Assam. *Lanius lephronotus*, Vigors, v. *nipalensis* of Hodgson: I have obtained three specimens. *Dicrurus cærulescens*; *Scolopax rusticola*. *Edolius retifer* I believe I before mentioned to you, and I have met with additional specimens of *Chaitaris rubeculoides*, *Phylloscopus fuscatus*, *Charadrius Cantianus*, &c. But it is chiefly in other classes that the past month has been productive of novelties, the most interesting of which are the reputed Entellus Monkey of Southern India, which is quite distinct from that of Bengal, and will bear the appellation *S. pallipes*, Elliot;—an apparently new Soosook Dolphin (*Platanida*) from the Hoogly;—and, most remarkable of all, a true Bison allied to the Aurochs and to the American species, from the Shan States bordering on China, inhabiting a suitable, cold and pine-clad region, and doubtless extending far to the north-east, within the Chinese dominions.

Calcutta, Dec. 22, 1843.

Here are some “more last words” for you, which as you will receive nearly as soon as those I sent a few days back by the “Bentinck” steamer, I may as well take the present opportunity of forwarding. The following are the *notabilia* which I have now to announce as additions to my Calcutta ornithology.

Scops sunia, Hodgson, As. Res. xix. 175. A pair of these beautiful little birds I have just obtained, which were taken with birdlime. I have also received the *Sc. lettia*, Hodgson, *ibid.*, from Midnapore, a species which Mr. Jerdon thinks different from his *Sc. javanica*, but which is probably enough the *Sc. javanica* of Dr. Horsfield’s list of species procured by Dr. M’Clelland in Assam. Mr. Jerdon has also obtained a very small species in Madras, which appears to be *Sc. bakkamæna*.

Lanius nigriceps, Franklin.

Turdus unicolor, Gould.

Dicrurus cærulescens I believe that I before mentioned, but I have shot a second example of this bird here.

Botaurus flavicollis; *Ardea flavicollis* et *niger*, Auct. Of this I have now obtained a recent example, and I have no hesitation in placing it among the true Bitterns.

Tringa alpina, for the first time; a solitary specimen.

Porzana akool; *Rallus akool* of Sykes, but not of Jerdon’s catalogue, which is my *Gallinula parvifrons*. The dark under tail-coverts

* This letter and the following arrived too late for our last Number.—
ED.

and deep brownish-red legs are conspicuous characteristics of the *Akool*. By the way, Mr. Jerdon's *Rallus rufescens* is merely a young female of *Gallinula lugubris*, Horsf., vel *plumbea* of Vieillot.

I have also had the luck to obtain, yesterday and today, two new Bats, in addition to several others which I have to describe of this group; and if a party of shikarees and stuffers had returned, as they should have done by this time, from a ten or twelve days' hunting expedition which I have sent them upon, it is probable that I should have some more novelties to inform you about. Of the gigantic heron formerly noticed, I may remark that the back-line of *A. cinerea* barely reaches to the belly-line of the new species, which will convey a somewhat definite idea of the magnitude of my splendid *Ardea nobilis*. This morning I obtained a fine new Mullet, allied to *Mugil cephalotus*, but having much larger eyes, and in other respects approximating *M. parsia*, Buch.; it is described neither by Buchanan nor by Russell, but I have not leisure now to refer to Valenciennes.

I remain, very truly yours,

E. BLYTH.

ON THE TRUE SITUATION IN THE SYSTEM OF TALEGALLA AND MENURA ?

Whilst prosecuting my examination of the *Foreign Anoplura* (an investigation intrusted to me by the British Association), I felt anxious to see the *Parasites* of some birds of rather doubtful character, or more properly speaking, whose place in the system had caused no little diversity of opinion amongst naturalists, from a conviction that these might throw some light upon the subject; having found from experience that certain genera were only found upon particular families of birds. I therefore applied to my friend Mr. Gould, who, from his intimate connexion with the ornithology of Australia, had better opportunity than perhaps any one else of supplying some of my desiderata*. This, with his accustomed zeal for furthering science, he immediately complied with, and transmitted me parasites from *Talegalla Lathamii* and *Menura superba*. The first of these was placed by Mr. Swainson amongst the *Vultures*, from certain characters which he considered confirmed his views. The general appearance of the bird however is decidedly *Rasorial*, and such its *parasites* declare it to be. They are of two genera, *Goniodes* and *Lipeurus*, the former of which, if not both, infest I believe almost every *Rasorial* bird. The latter genus is also parasitic on the *Raptores*, *Grallatores* and *Natatores*, but the former never. Had *Talegalla* been *Rasorial*, we should in all probability have found the genera *Læmobothrion*, *Colpocephalum*, *Docophorus* and *Nirmus*, as well as *Lipeurus*, which was not the case. With respect to *Menura*, the parasites would indicate this bird to be truly *Insessorial*; here two genera also were found, *Nirmus* and *Menopon*, the former almost exclusively confined to the *Insessores*, *Grallatores* and *Natatores*. One or two are certainly found among the *Raptores*, and about the same number in *Rasores*, as the *Nirmus cameratus* on moor game, and *Nirmus quadrulatus* on the wood grouse; but these are by no means characteristic of the *Rasores*, as is the case

* Mr. Denny would be thankful for similar aid from Mr. Blyth.—R. T.

decidedly with *Goniocotes*, *Goniodes* and *Lipeurus*, not one of which appears to infest *Menura*. The *Nirmus* found is I suspect the *N. marginalis* of Nitzsch and Burmeister, and approaches most nearly to those of the *Merulidæ*. If therefore any weight is to be attached to the constancy of the parasitism of certain genera upon particular families of birds, the result of my inquiry would be that *Talegalla* really belongs to the *Rasores*, not far from the turkey, and that *Menura* is *Insessorial*. The result in the latter case, which is the most debatable, appears to be confirmed from the fact, that the *parasites* were not from *one* specimen only of the bird, but *five*. Mr. Gould very ingeniously took care of this: he sent me two specimens in the first instance from *Menura*, and afterwards specimens from four different individuals of the bird, both *old* and *young*, in separate papers, but without any indication from whence they were obtained, to ask if they were *new* to me and what they approached most nearly to.

Phil. Hall, Leeds, March 19, 1844.

HENRY DENNY.

UPON THE METAMORPHOSES OF ELEDONA AGARICOLA AND DIAPERIS
BOLETI. BY M. LEON DUFOUR.

The larvæ of both these insects feed, observes our author, upon the compact but friable substance of the *Boletus imbricatus*, in which they perforate cylindrical galleries in different directions, without any regularity, and more or less obstructed by a powdery *detritus*. When the larvæ have attained their full growth, they proceed to prepare a *nidus*, in which to undergo their metamorphoses; and this is constructed in the following very singular manner. Having selected a portion of the fungus not traversed by galleries and of a compact and solid structure, the little *Eledona*, with no other implements than its mandibles, contrives yet skilfully to chisel out (by working gradually upon the circumference of a cavity which it first of all commences) a spheroidal piece, until this has become completely isolated from its interior; feeding the while upon the materials as it is making in them its circular incision, so that when the work is finished, a white powder, composed chiefly of its *egesta*, is interposed betwixt the cell and the contained mass. The latter, which is about 7—8 millimetres long by 6—7 in width, is now perforated from one end to the other by a cylindrical canal adapted to the size of the larva. Here again it devours the materials as they are excavated; and then, after having given the cell its due proportions, and polished its interior for the reception of the delicate nymph, it closes most accurately with its powdery excrement the two apertures, curves upon itself, and becoming motionless and torpid, resigns itself to its changes, apart from further observation. The cocoon of the larva of *Diaperis* is formed in a similar manner, but I have never detected in it more than a single aperture, whereas two, as already stated, exist in that of *Eledona*. There are numbers of larvæ which fabricate a case either purely of silk, or with wood, earth, &c. interblended; in some even the skin hardens, becomes detached, and so forms a protecting envelope to the pupa; but, to my knowledge, the fact has never before been recorded of a fungivorous larva making such curious use of the very substance upon which it feeds.—*Ann. des Sc. Nat.* A. T.

APTENODYTES.

The Antarctic Expedition having brought home several specimens of this genus, we are now enabled to clear up the doubt which has long existed with regard to the question, whether there be more than one species. The result of a careful comparison is, that there are two species confounded under the appellation of *Aptenodytes patachonica*. The Patagonian Penguin of Pennant (in the Phil. Trans. lviii. 91) is I believe the original figure, but on comparing it with those of most modern authors, there can be no doubt that they are distinct. The author who first gave the Latin specific name was Shaw, who described the figure of J. F. Miller (Illustr. Nat. Hist. t. 33.). This figure was copied from the drawings of the Forsters, who accompanied the great Cook in his second expedition; and the same figure was also copied by Pennant in his 'Genera,' t. 14, and by J. R. Forster in the 'Commentationes Gottingenses,' iii. t. 11. Now Shaw's *Aptenodytes patagonica*, taken from Forster's drawings, is not the Patagonian Penguin of Pennant in the 'Philosophical Transactions,' but a distinct species, which the voyagers term the "Emperor," while that of Pennant is their "King." The differences are—

"Emperor."

From the tip of bill to tip of tail, 50 inches.

Tip of bill to gape, 5 inches.

Base of lower mandible not dilated.

Yellow of the sides of head passing insensibly into white on the sides of neck, where it is divided by a projecting point of the same colour as the back.

Black under the throat, short, and divided in front in the middle by a point of the white feathers of the chest.

"King."

From the tip of bill to tip of tail, 44 inches.

Tip of bill to gape, 4½ inches.

Base of lower mandible dilated.

Yellow of the sides of head deep, and passing at once into deep orange on the chest, gradually becoming white on the breast.

Black under the throat, ending in a blunt point on the chest.

The "Emperor" is unquestionably the *Aptenodytes Patachonica* of Shaw in Miller's 'Illustrations,' but not of the same author in the Leverian Museum, where the bird figured under that name is the "King." It seems desirable therefore, to avoid confusion, both Pennant and Shaw having on different occasions given the name of Patagonian Penguin and *Aptenodytes Patachonica* to each of the two species, to suppress those names altogether, and to call Pennant's species (the "King") *Aptenodytes Pennantii*, and Forster's (the "Emperor") *Aptenodytes Forsteri*.

As a lengthened account of these birds will be given in the forthcoming work on the Zoological Collections brought home by Capt. Sir James Ross's Antarctic Expedition, it is unnecessary to enter more into detail for the present.

GEORGE ROBERT GRAY.

ON THE TRANSMISSION OF HYDATIDS BY CONTAGION.

The following is an abstract of a very interesting paper by Prof. Klencke of Brunswick, entitled "Researches upon the Transmission of Hydatids by Contagion" (from the Gazette Médicale, Dec. 1843).

After commenting upon the vague manner in which the term hydatid has been applied in practical medicine to every abnormal production having the form of a cyst, the author proposes to limit it to the following definition:—"Every vesicular production found in living organized tissues which is provided with spontaneously moving organs, or which has at least the power of reproduction apart from the tissue in which it is lodged by giving birth to individuals similar to itself." He then gives a sketch of the specific characters of the different species included under the names of *Hydatid spuria*, *Acephalocystis*, *Echinococcus*, *Polycephalus* or *Cænurus*, and *Cysticercus*. The first of these, commonly met with in the brain and spinal marrow, and which consists of one or more simple cells filled with fluid and containing some minute globules, has, he says, been almost always confounded with the true hydatid or *Acephalocyst*, whereas it is not a distinct animal, but consists of certain elementary cells of the tissue, which by a process of normal (abnormal?) evolution have become isolated from the rest of the organism, and are capable of maintaining an independent existence. This opinion will be seen to coincide very closely with that of Prof. Owen in his Hunterian Lectures relative to the *Acephalocyst*, namely, "that it is a gigantic organic cell, not a species of animal, even of the simplest kind;" but the cellules of this species he regards on the contrary as true organized beings, having the power of generation, and in the latter part of the paper adduces reasons for regarding them as but a primary form of the *Echinococcus*; 1st, from his having found the latter chiefly in different aquatic animals, such as tortoises, frogs, fishes and water-birds, also in mammalia and man; 2nd, from having found in clear spring-water some small pyriform or lanceolated animalcules $\frac{1}{20}$ th of a Paris line in diameter, which had instead of a coronet of hooks a disc covered with radiating striæ, and furnished in its centre with only a single spine; 3rd, that these animalcules were so exactly similar in form and character to the *Acephalocysts* at the period of their transformation into *Echinococci*, that no appreciable difference could be detected either by himself or other skilful observers between them. He thinks it not improbable therefore that the *Echinococci* may exist in nature, if not in a perfect form, at least as ovules, in the water, and that with it they are introduced into the bodies of different animals, there to undergo further development, and that they may then work their way by means of their hooks from the intestinal canal into the interior of the tissues, and from their very minute size, even into that of the circulating system. It is curious to compare our author's statement upon the identity of the *Acephalocyst* and *Echinococcus*, with one recently made by M. Eugène Livois in a work called '*Recherches sur les Echinocoques chez l'homme et chez les animaux*,' Paris, 1843, who asserts "that no good examination has been yet made of the cellules of the *Acephalocyst*; that they are in reality clusters of *Echinococci* whose head is not yet protruded, but which, when they have attained their full development, separate, and are found floating in the fluid of the sac, and that in upwards of 800 examinations he never found these parasites absent in a single hydatid." Leaving this question as one still open to further investigation among microscop-

pists, the most important part of Prof. Kléncke's memoir is that occupied with an account of the experiments which he performed upon propagating hydatids by means of inoculation. Some few of these will be here detailed with the general conclusions to which they lead, with the view not merely of gratifying the reader's curiosity, but it is hoped of stimulating those who have time and opportunity to test their truthfulness for themselves, by methods, however, as consistent as is possible with the feelings of humanity.

"In order to study the reproductive power of the false hydatid, I selected two puppies and two kittens, and injected by a trocar into their abdominal cavity warm water containing some of these hydatids, which I had collected from the brain of a fresh human subject. After the injection I closed the opening carefully; the animals did not appear to suffer much from the operation, were restored to their parents and grew perfectly well. At the end of three months I found, upon examining the abdomen in setting out from the punctured wound, an adherence of the parietal layer of the peritonæum with the epiploon at the seat of puncture, and upon this adhesion as well as upon the internal surface of the peritonæum, in the neighbourhood of the cicatrix, there existed in both the puppies and in one of the kittens a very great number of false hydatids. In the other kitten, in which no adhesions had taken place, there was no trace of these productions in the neighbourhood of the cicatrix, whilst upon the peritonæal surface of the bladder a mass of false hydatids was found projecting into the abdomen.

"I took some very small hydatidic cellules from the plexus choroïdes of a man, and inoculated with them the orbit of a hen. The inflammation which supervened subsided by the eighth day. At the end of thirteen weeks the whole external wall of the orbit was tumefied and the eye pushed inwards. Upon examination after death, the orbit was found filled with a cellular mass containing a very great number of false hydatids.

"The whole brood of these hydatids was injected into the femoral vein of a kitten. At the end of three weeks the animal became sullen and habitually sleepy. Upon autopsy there was found in the heart, and especially in the right auriculo-ventricular orifice, a fibrinous and gelatinous precipitate containing an innumerable quantity of false hydatids."

The false hydatids are more rare in animals than in man, and their transmission is more easily effected when the species of animal inoculated is not far removed from that which furnished the parasite. In regard to the Acephalocysts and Echinococci, the author says that he has found the former in the milk of the cow, and floating along with them in the serum of that fluid, the small ovules that are met with in the body of these animals. Both forms of hydatid are met with daily in the flesh and blood of animals, and if the process of cooking does not destroy them, we must run continual risk of contagion. With a view of ascertaining next what effect digestion would produce upon them, he instituted the following experiment.

"I placed some full-grown Echinococci in the gastric juice of a dog and that of a man. At the end of three hours they appeared

dead, their head being retracted, and they exhibited no signs of movement. After having washed them well in warm water, I introduced them into the subcutaneous cellular tissue of the thigh of a kitten; eight days afterwards the wound had cicatrized. I next took some Echinococci which had been immersed in gastric juice diluted with half the quantity of milk or water, and inoculated a young dog by an incision in the abdomen reaching to the peritonæum, but without opening the latter, upon which I placed two of the parasites; the wound was accurately closed by suture, and at the end of three weeks I found a cellular and highly vascular cavity, containing a yellowish serosity, in which were two Echinococci, remarkably modified in form. They were transformed into vesicles, covered upon their external surface with a number of gemmules and isolated cells supported by pedicles. Examined under the microscope, these cells, upon being crushed, gave exit to a multitude of other small cells, similar to those found in the body of the Acephalocysts, and which represented the ovules. The hydatids being open exhibited upon their internal surface a still greater number of gemmules, pediculated cells, and other cells floating freely in the liquid."

The author particularly recommends this mode of experimenting, as by placing the vesicles between the peritonæum and abdominal parietes they can be disclosed for examination at different intervals, and their different stages of development followed out, without the necessity of killing the animal.

External injuries seem to favour the development of hydatids.

"I injected a fluid charged with ovules of the Echinococcus into the crural vein of two puppies, two old cats, and a guinea-pig. Eight days afterwards I made an incision in the tongue of one of the dogs, and the abdominal muscles of the other; one of the cats received a blow upon the liver and vomited; the second was slightly pinched with an instrument behind the left eye-ball; the skin of the guinea-pig's thigh was compressed so as to produce ecchymosis. The five animals were examined three weeks afterwards. In the guinea-pig five well-marked Acephalocysts were found in the cellular tissue beneath the part that had been pinched. The liver of the cat presented a sac full of Acephalocysts. The three other animals offered no results."

It is sufficient in experimenting with the *Cœnuri* (so often found in sheep affected with vertigo) to take a cephalic segment and introduce it by trepan into the brain of a dog, or inject it into the circulatory current, and at the end of ten or twenty days a perfect vesicle is found filled with young embryos of the parasite. If these are inclosed in a bottle and moistened occasionally with water enough to prevent their drying, they decompose at the end of four or five days and are converted into a fluid, which, with a little serum added, answers also for the purposes of inoculation. The *Cysticercus* is the most easily transmitted by inoculation. Entire specimens may be used, or the gemmules formed upon the interior and exterior of their membrane; they are found in all parts of the body, in the blood, the respiratory passages, and the internal surface of the alimentary canal. Boiling water destroys the *Cysticerci*, but not their ova; immersion

in a solution of arsenic does not prevent the development of the latter, while acetic acid and camphor destroy them. Prof. Klencke deduces the following conclusions from an extensive series of experiments :—

1st. That in all hydatids we observe a cyssiparous and oviparous reproduction.

2nd. That there are false hydatids which propagate by blastoderm (blastidie).

3rd. That all hydatids are transmitted from one organism to another, and being found in our fluid aliments and in the flesh of animals can be transmitted by infection.

4th. That the Acephalocysts are not distinct from the Echinococci, but merely the ova of the latter with or without the parent cyst.

5th. That whatever be the way by which they have entered the animal system, hydatids can be conveyed by the current of the circulation.

6th. That certain agents in the organism and medical substances have the power of destroying them.

A. T.

METEOROLOGICAL OBSERVATIONS FOR FEBRUARY 1844.

Chiswick.—February 1. Frosty : very clear and dry : frosty. 2. Snowing : frosty at night. 3. Frosty : clear, with bright sun : overcast and frosty. 4. Snow in broad flakes : densely clouded and rapid thaw at night. 5. Frosty : clear : severe frost. 6. Sharp frost : clear and fine : overcast. 7. Hazy, with slight rain : overcast : heavy and continued rain in the evening. 8. Frosty : very clear : frosty. 9. Frosty : lightly clouded : densely overcast. 10. Cloudy. 11. Slight rain. 12. Uniformly overcast : clear and fine : foggy and frosty. 13. Frosty, with dense fog : frosty, with fog at night. 14. Thick hoar-frost : clearing : overcast. 15. Slightly overcast and fine : hazy, with rain. 16. Clear and fine. 17. Overcast : clear. 18. Cloudy : slight rain at night. 19. Densely clouded : clear and windy. 20. Clear and frosty : fine : clear, with sharp frost at night. 21. Snowing in broad flakes : sleet and rain : hazy. 22. Snowing : clear and frosty. 23. Sharp frost : overcast : heavy rain from six till nine P.M. 24. Clear : cloudy : clear and frosty. 25. Rain : squally : cloudy and fine. 26. Heavy clouds and showers : stormy, with rain at night. 27. Clear, cold and dry. 28. Clear and cold : fine, with sun : cloudy. 29. Very fine : rain.—Mean temperature of the month 3·59° below the average.

Boston.—Feb. 1. Fine. 2. Cloudy : snow early A.M. 3. Fine. 4. Snow. 5, 6. Fine. 7. Rain : rain early A.M. 8. Fine : rain early A.M. 9. Fine. 10. Fine : snow A.M. 11. Snow : snow early A.M. 12. Fine. 13—15. Cloudy. 16, 17. Fine. 18. Fine : rain P.M. 19. Cloudy : rain A.M. 20. Fine. 21. Cloudy : snow P.M. 22. Cloudy. 23. Cloudy : snow early A.M. : snow P.M. 24. Stormy : snow P.M. 25. Cloudy : rain A.M. and P.M. 26. Cloudy : thunder P.M. 27. Fine : snow early A.M. : snow P.M. 28. Cloudy. 29. Fine : melted snow.

Sandwick Manse, Orkney.—Feb. 1. Bright : clear large halo. 2. Bright : clear : fine. 3. Bright : cloudy. 4. Damp : showers. 5. Showers. 6. Snow-showers : cloudy. 7. Rain : showers. 8. Snowing : aurora. 9, 10. Snow-showers. 11. Bright : cloudy. 12. Bright : cloudy : thaw. 13. Cloudy. 14. Drizzle : cloudy. 15, 16. Showers : sleet. 17. Bright : clear aurora. 18. Cloudy : snowing. 19. Snow-drift. 20. Snow-showers. 21. Bright : snow-showers. 22. Snow-showers : drift. 23. Bright : drift. 24, 25. Drift. 26. Bright : snow-showers. 27. Bright : haze. 28. Bright : clear. 29. Bright : large halo.

Applegarth Manse, Dumfries-shire.—Feb. 1. Frost. 2. Frost and snow. 3. Frost : clear. 4. More snow : frost. 5. Frost : clear. 6. Frost. 7. Snow. 8. Snow : frost. 9. Thaw. 10, 11. Frost. 12. Snow : frost. 13. Thaw. 14. Thaw and fog. 15. Fine thaw and rain. 16. Slight showers. 17. Showers P.M. 18. Very wet. 19. Rain : slight showers. 20. Frost again. 21. Frost : a little snow. 22. Frost : snow-shower. 23. Heavy fall of snow : frost. 24—27. More snow : frost. 28. Snow and thaw. 29. Rain P.M.

Meteorological Observations made by Mr. Thompson at the Garden of the Horticultural Society at CHISWICK, near London; by Mr. Veall, at BOSTON; by the Rev. W. Dunbar, at Applegarth Manse, DUMFRIES-SHIRE; and by the Rev. C. Clouston, at Sandwick Manse, ORKNEY.

Days of Month.	Barometer.						Thermometer.						Wind.				Rain.						
	Chiswick.		Dumfries-shire.		Orkney Sandwick.		Chiswick.		Boston.		Dumfries-shire.		Orkney Sandwick.		Boston.		Dumfries-shire.		Orkney Sandwick.				
	Max.	Min.	8 $\frac{1}{2}$ a.m.	9 a.m.	9 p.m.	8 $\frac{1}{2}$ p.m.	Max.	Min.	8 $\frac{1}{2}$ a.m.	Max.	Min.	9 $\frac{1}{2}$ a.m.	8 $\frac{1}{2}$ p.m.	Chiswick 1 p.m.	Boston.	Dumfries-shire.	Orkney Sandwick.	Chiswick.	Boston.	Dumfries-shire.	Orkney Sandwick.		
1844.																							
Feb.																							
1.	30.018	29.902	29.62	29.93	29.73	29.68	39	20	27.5	35	25	38	36	nw.	calm	wnw.	w.	.....	.....	.....	.....	.....	.....
2.	29.596	29.469	29.26	29.35	29.78	29.90	39	23	32	36 $\frac{1}{2}$	27	34	36 $\frac{1}{2}$	e.	calm	e.	calm	.....	.....	.....	.....	.....	.....
3.	29.943	29.914	29.55	29.94	29.90	30.02	40	28	29	38	27 $\frac{1}{2}$	35	33	s.	calm	ne.	n.	.....	.....	.....	.....	.....	.....
4.	29.697	29.427	29.37	29.44	29.44	29.40	40	25	31	40	22	38	37	nw.	calm	ne.	n.	.....	.....	.....	.....	.....	.....
5.	29.495	29.403	29.15	29.33	29.40	29.20	40	19	24	35	21 $\frac{1}{2}$	41	40 $\frac{1}{2}$	w.	calm	ne.	wnw.	.....	.....	.....	.....	.....	.....
6.	29.560	29.459	29.20	29.40	29.30	29.30	43	26	28	32	14	40	35 $\frac{1}{2}$	w.	calm	ne.	w.	.....	.....	.....	.....	.....	.....
7.	29.272	29.177	28.93	28.96	28.86	28.75	45	31	36	39	25	36	37	w.	w.	w.	se.	.....	.....	.....	.....	.....	.....
8.	29.371	29.309	28.95	28.94	28.99	28.60	45	27	35	36	30	35	36	w.	calm	wsnw.	se.	.....	.....	.....	.....	.....	.....
9.	29.185	29.164	28.84	28.90	29.36	29.32	44	32	31.5	40 $\frac{1}{2}$	32	34	34	w.	calm	n.	ne.	.....	.....	.....	.....	.....	.....
10.	29.639	29.417	29.09	29.50	29.72	29.65	43	31	35	37	26	34	33	n.	w.	n.	ne.	.....	.....	.....	.....	.....	.....
11.	29.937	29.764	29.50	29.83	29.92	29.95	39	30	33	36 $\frac{1}{2}$	29	35	35 $\frac{1}{2}$	n.	calm	nw.	calm	.....	.....	.....	.....	.....	.....
12.	29.993	29.974	29.68	29.80	29.86	29.79	39	22	26	37	30 $\frac{1}{2}$	36 $\frac{1}{2}$	38	nw.	calm	nne.	s.	.....	.....	.....	.....	.....	.....
13.	30.090	30.073	29.77	29.90	29.86	29.70	32	23	25.5	38 $\frac{1}{2}$	21	43	45	w.	calm	w.	sw.	.....	.....	.....	.....	.....	.....
14.	30.066	29.995	29.74	29.78	29.67	29.62	42	32	33	43 $\frac{1}{2}$	36	45	46	sw.	calm	ssw.	sw.	.....	.....	.....	.....	.....	.....
15.	29.947	29.919	29.50	29.55	29.80	29.41	49	27	40	48	41	43 $\frac{1}{2}$	39 $\frac{1}{2}$	sw.	calm	w.	w.	.....	.....	.....	.....	.....	.....
16.	30.171	30.146	29.74	29.85	29.90	29.60	49	30	36.5	46	34	40	35	w.	calm	w.	w.	.....	.....	.....	.....	.....	.....
17.	30.108	29.983	29.63	29.81	29.72	29.71	50	36	38	45	39	29 $\frac{1}{2}$	35	sw.	calm	sw.	nw.	.....	.....	.....	.....	.....	.....
18.	29.824	29.558	29.36	29.49	29.19	29.69	49	39	40	46	40 $\frac{1}{2}$	38	32 $\frac{1}{2}$	s.	calm	ssw.	e.	.....	.....	.....	.....	.....	.....
19.	29.498	29.292	28.88	29.30	29.47	29.35	50	29	41.5	44	37	35 $\frac{1}{2}$	30	sw.	w.	e&sw.	ne.	.....	.....	.....	.....	.....	.....
20.	29.792	29.765	29.35	29.67	29.62	29.60	42	20	32	37	27	29	26	nw.	nw.	nw.	n.	.....	.....	.....	.....	.....	.....
21.	29.528	29.235	29.22	29.35	29.29	29.40	42	32	31	33 $\frac{1}{2}$	26	30	25	s.	calm	e.	e.	.....	.....	.....	.....	.....	.....
22.	29.660	29.262	29.06	29.46	29.48	29.42	40	19	34	36	22	32 $\frac{1}{2}$	28	e.	calm	e.	nw.	.....	.....	.....	.....	.....	.....
23.	29.985	29.651	29.42	29.50	28.90	29.50	50	33	30	35 $\frac{1}{2}$	23 $\frac{1}{2}$	29	29 $\frac{1}{2}$	sw.	calm	se.	s.	.....	.....	.....	.....	.....	.....
24.	29.614	29.055	28.65	29.00	29.38	29.00	51	27	34	35	24 $\frac{1}{2}$	27	24	nw.	nw.	e.	ese.	.....	.....	.....	.....	.....	.....
25.	29.478	29.000	29.20	29.12	28.85	29.45	51	37	35	35	24 $\frac{1}{2}$	30 $\frac{1}{2}$	28	sw.	calm	e&nw	ese.	.....	.....	.....	.....	.....	.....
26.	28.922	28.624	28.41	28.66	29.15	29.22	52	26	37.5	34 $\frac{1}{2}$	30 $\frac{1}{2}$	29	30	sw.	calm	ne.	e.	.....	.....	.....	.....	.....	.....
27.	29.447	29.382	29.13	29.27	29.27	29.10	40	32	26.5	36 $\frac{1}{2}$	13	32	21	nw.	nw.	w.	e.	.....	.....	.....	.....	.....	.....
28.	29.649	29.480	29.23	29.32	29.22	29.30	51	29	37	40	30 $\frac{1}{2}$	25	26	nw.	calm	w.	e.	.....	.....	.....	.....	.....	.....
29.	29.595	29.405	29.27	29.38	29.05	29.20	53	43	37	43	32 $\frac{1}{2}$	31	35	sw.	calm	se.	n.	.....	.....	.....	.....	.....	.....
Mean.	29.692	29.524	29.26	29.439	29.452	29.452	44.44	28.55	32.9	38.5	28.0	35.03	33.34	2.27	1.80	2.05	3.22						